# NON-ROV Design Document

Power Supply

The **electronic system** is supplied by a 12V battery pack (8xAA batteries). We use two ESP32 for the communications between the float and the PC, one mounted on the **FLOAT** board and the other one connected by Serial with the **Control Station.** The **stepper motor** and its driver are powered at 12V. The 12V are also converted to 5V for the other components on the board: the Real-Time Clock (PCF8523) used for getting the time and date, the microSD slot used for writing the data on a **microSD**, and the **ESP32**.

Board Interconnections

For the **data transmission** we used the ESP-now communication protocol. Both of the ESP32 are set in WiFi station mode, and the two ESP32 communicate with each other to transmit data and commands. Depth, **pressure and temperature information** come from a Bar02 mounted on the float board communiting with the ESP32 through I2C protocol. Date and time are provided by the **RTC** (**PCF8523**) also connected by I2C. SPI is used to write to/read from the microSD slot.
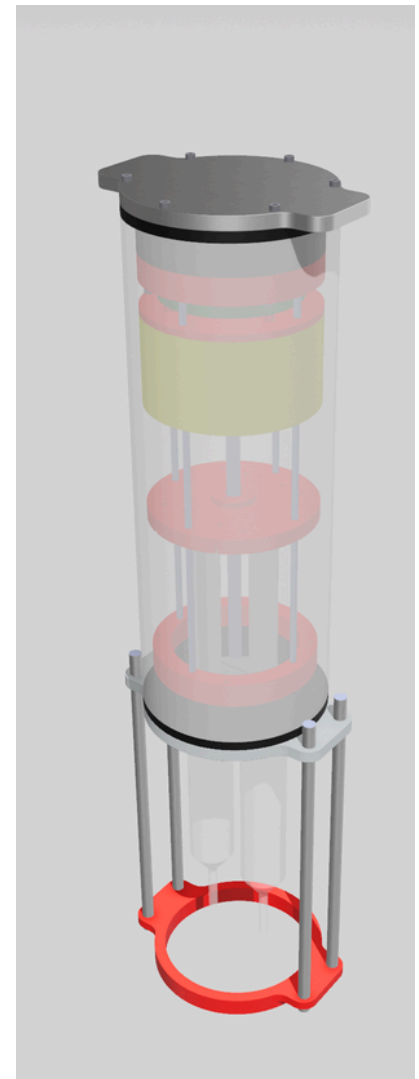
Float 3D model

Underwater behaviour

When the **float** receives a signal from the PC, it initializes the descent: the board sets in motion the stepper motor **NEMA 17**, that moves the syringes in order to take the water in.
During the profile, the **ESP32** reads data form the bar02 and saves it in a file on the microSD card.

Once the float reaches the seabed, the barometer doesn't detect a pressure variation anymore, so the stepper motor moves the syringes again to take the water out, and the float returns to the surface to transmit the data collected during the vertical profile, reading it from the microSD card.